APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/524,725	03/14/2000	Mehryar Garakani	50325-0088	8997

29989   7590   09/25/2003

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EXAMINER
SWICKHAMER, CHRISTOPHER M

ART UNIT	PAPER NUMBER
2697	

DATE MAILED: 09/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>01 July 2003</u> .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-28</u> is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-5,10-18 and 23-28</u> is/are rejected.

7)☒ Claim(s) <u>6-9 and 19-22</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on <u>01 July 2003</u> is: a)☒ approved b)☐ disapproved by the Examiner.

     If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All b)☐ Some * c)☐ None of:

         1.☐ Certified copies of the priority documents have been received.

         2.☐ Certified copies of the priority documents have been received in Application No. _____ .

         3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

     a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .	6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1.   This Office Action is in response to the amendment filed 07/01/03. The Examiner

approves the amendments to the specification and drawings. The previous rejection is

withdrawn. Claims 1-28 are pending. Currently no claims are in condition for allowance.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed
> in the United States before the invention by the applicant for patent or (2) a patent granted on an application for
> patent by another filed in the United States before the invention by the applicant for patent, except that an
> international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this
> subsection of an application filed in the United States only if the international application designated the United
> States and was published under Article 21(2) of such treaty in the English language.

3.   Claims 1-4, 10-27, and 23-28 are rejected under 35 U.S.C. 102(e) as being anticipated by

Hsu (USP 6,363,319). Referring to claims 1, 14, 27, and 28, Hsu discloses a method, a computer

program with sets of instructions, a signal carrying sequences of instructions, and a processor

with memory (see claims 1, 17, and 33 of Hsu) for determining an optimal (logical) path in a

managed network between a source device and a destination device at a data link layer by using

Multi-protocol Label Switching Protocol (MPLS, MPLS inherently operates at layer 2, which is

the data link layer, col. 2, lns. 50-col. 3, lns. 10), the method comprising the

computer-implemented steps of: creating and storing a directed graph (Connected Group Space

representation) of network devices based on the network topology (a topology space

representation) of the network devices (Fig. 3, col. 5, lns. 13-35); identifying an optimized path

in the directed graph by the cumulated cost to the destination (Connected Group Space representation, col. 5, lns. 43-55); the system inherently transforms the optimized path from the directed graph into the network topology (topology space representation); and inherently creating and storing the optimized path that was transformed into the network topology (topology space representation) as the MPLS path (data link layer path, col. 5, lns. 13-25).

- Referring to claims 2 and 15, Hsu discloses the method as recited in Claims 1 and 14, wherein the managed network is a managed IP network. MPLS was designed to run on top of the IP layer and used to transport IP data.

- Referring to claims 3 and 16, Hsu discloses the method as recited in Claims 1 and 14, wherein the step of creating and storing a directed graph (Connected Group Space representation) further comprises the steps of: identifying a set of vertices (Connected Group nodes) associated with the directed graph (Connected Group Space representation); identifying directed graph unidirectional links (Connected Group links) that connect the vertices (Connected Group nodes); and creating and storing information that represents the unidirectional links (Connected Group links, Fig. 3, col. 5, lns. 13-col. 6, lns. 10).

- Referring to claims 4 and 17, Hsu discloses the method as recited in Claims 1 and 14, wherein the step of creating and storing a directed graph (Connected Group Space representation) further comprises the steps of: identifying a set of candidate vertices (subnet) associated with the source device and the destination device; determining a set of candidate unidirectional links (network links) that link one or more network devices in the managed network; and which would inherently determine an assignment of ports of network devices (col. 5, lns. 25-35).

- Referring to claims 10 and 23, Hsu discloses the method as recited in Claims 1 and 14, wherein the step of identifying an optimized path in the directed graph (Connected Group Space representation) further comprises the step of finding a shortest path between a (Connected Group) source node and a (Connected Group) destination node (col. 5, lns. 43-55).

- Referring to claims 11 and 24, Hsu discloses the method as recited in Claims 10 and 23, further comprising the step of using a Dijkstra algorithm to find the shortest path between the (Connected Group) source node and the (Connected Group) destination node (col. 5, lns. 43-55).

- Referring to claims 12 and 25, Hsu discloses the method as recited in Claims 1 and 14, wherein the step of transforming the optimized path into the network topology (topology space representation) further comprises the steps of: identifying an ordered set of vertices (Connected Group nodes) associated with the optimized path; and identifying an ordered set of unidirectional links (Connected Group links) associated with the ordered set of vertices (Connected Group nodes, col. 5, lns. 43-55). The system inherently transforms the series of vertices and links found to have the lowest cost in the directed graph into the actual connectivity in the network domain.

- Referring to claims 13 and 26, Hsu discloses the method as recited in Claims 12 and 25, further comprising the steps of: identifying a pair of interfaces associated with each unidirectional link (Connected Group link) in the ordered set of vertices (Connected Group nodes) associated with the optimized path; and generating an ordered set of topology space links from the pairs of interfaces associated with unidirectional (Connected Group) links (Fig. 3, col. 5, lns. 13-55). The system finds the interfaces associated with the links associated with the optimized path.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

5.   Claims 5 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu in

view of Chang (USP 2003/0123448 A1). Referring to claim 5, Hsu discloses the method as

recited in Claim 1, but does not expressly disclose wherein the step of creating and storing a

directed graph (Connected Group Space representation) further comprises the steps of

identifying all Virtual Local Area Networks (VLANs) associated with the set of candidate

vertices (a subnet) associated with the source device and the destination device; and identifying

all Emulated Local Area Networks (ELANs) associated with the set of candidate vertices

(subnet). Nodes in MPLS inherently may be part of a subnet (see Fedyk et al, USP 6,560,654 for

supporting evidence). Chang discloses that VLANs and ELANs are used to emulate LANs on an

ATM network (paragraph [0025]). VLANs and ELANs are types of subnets supported in ATM.

MPLS can be used to transport ATM traffic (paragraph [0043]). The system of Hsu could be

modified so that the vertices in the directed graph would be able to identify and represent any

ELAN or VLAN subnets in the directed graph as vertices. At the time the invention was made, it

would have been obvious to one of ordinary skill in the art to modify the system of Hsu so that

the vertices in the directed graph identified all VLANs and ELANs between the source and

destination. One of ordinary skill in the art would have been motivated to do this since MPLS

can be used to identify a subnet as a single node. VLANs and ELANs are two types of subnets associated with ATM, and ATM can be transported by MPLS.

Allowable Subject Matter

6.   Claims 6-9 and 19-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

       - Referring to claims 6 and 19, claims 6 and 19 are allowable over the prior art of record since the cited references taken individually or in combination fail to particularly disclose a method or a computer readable medium that creates nodes in the Connected Group representation for: any pair of interfaces in the topology space representation, interfaces that are on the same medium, interfaces on the same ELAN, for each internal interface of the network device, for the source and destination node, and the user interface. The closest prior art of record, Hsu USP 6,363,319, discloses a similar system, but does not expressly disclose creating nodes for all of the devices and interfaces as claimed.

Response to Arguments

7.   Applicant's arguments with respect to claims 1-28 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

- Fedyk et al, USP 6,560,654. *Apparatus and Method of Maintaining timely*

  topology data within a link state routing network.

9.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Christopher M Swickhamer whose telephone number is (703)

306.4820. The examiner can normally be reached on 8:00-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Hassan Kizou can be reached on44. The fax phone number for the organization

where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (703) 305.3900.

CMS
September 9, 2003

HASSAN KIZOU
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TECHNOLOGY CENTER 2600